USA TICKET
SERVICE MANUAL

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Distributed in the United States of America by ;

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1. INFORMATION.

1.1 This Manual is intended as a guide to the operation, servicing, faultfinding and repairs on the Surfs Up machines.

1.2 All details and specifications shown in this manual are correct at the time of print. The right to modify equipment, change specifications and instructions at any time, without notice is reserved as part of Harry Levy Amusement Contractor Ltd policy of continuous development and improvement.

1.3 Only qualified, professional personnel should gain entry to the machine, and the author or Harry Levy Amusement Contractor Ltd. accepts no liability for any damage or injury arising from the use of this service manual.

2. GENERAL SERVICING

2.1 Replacement Parts.
It is of mutual interest that equipment is kept in excellent working condition, therefore when requested please order original replacement parts from your distributor or Harry Levy Amusement Contractor Ltd. The parts list is at the back of this manual.

2.2 Ticket dispensers.
The ticket dispenser is a Deltronic DL 1275 unit. Please refer to the yellow manual for ticket machine adjustment and electrical specification.

2.3 Hopper. (USA)
WARNING: DO NOT DISCONNECT OR RECONNECT UNLESS THE MACHINE IS SWITCHED OFF
This is an Asahi Seiko SH400 hopper. The opto sensor is replaceable. The coin discs are interchangeable for different coin sizes.

2.4 Swipe Changer Hopper (USA)
This is a Coin Controls Universal hopper. There are no user serviceable parts.

3. DESCRIPTION OF THE GAME

3.1 Attract mode.
Switch the machine on, the coin ejector will spin twice to clear itself, the topsign and playfield lamps will light and the motor will turn the pusher paddle. After some time (depending on the switch settings) the attract mode tune will operate. If the volume needs adjusting, the control is on the main logic board in the rear of the machine.
Tilt the machine to test the alarm. It will sound for approx. 12 seconds. **See also section 6.6.**

3.2 The game
Insert a coin. (Coins of the wrong type are rejected internally). It will be ejected over the playfield towards the targets. The coin-in sound is heard. If an animal target is hit, an animal sound is heard and tickets awarded as per switch settings. If a lit target is hit, a bonus sound is heard and tickets awarded. The coin then slides or bounces down to the playfield and is pushed forward by the paddle. Coin-in tickets are an option. Coins falling from the playfield (USA machine) activate the Piezo microphone. They are counted into the cashbox by the hopper and tickets are awarded. A Token hopper for swipe card / cash payout is optional. All target awards can be set independently when not lit. They are grouped into two pairs for lit bonus awards.

When tickets run out `Call attendant' is broadcast. Do not switch the game off. Open the front door. Fill the ticket bin. Feed the tickets into the dispenser. The game will re-start the dispenser and complete the award (if any).

4. SPECIFICATIONS

			1 player
4.1	Dimensions.	Height	1172mm / 76”
		Width	575mm / 22 ¾”
		Depth	840mm 33”

		1 player
4.2	Electrical ratings	
	At 110 Volts 60 Hz:	2 Amps / 220 Watts
	At 230 Volts 50 Hz:	1 Amp / 230 Watts

Fuses - There is a 3 Amp reset type fuse in the mains switch box.

Low voltage fuses are in the power supply – see section 6.

4.3 Error codes and alarm signals

If the alarm bell sounds then the tilt has been activated. The tilt will automatically time-out, and reset. If the paddle jams, the paddle motor stops and the message `Please call the attendant’ is broadcast. This will require an engineer to rectify the fault and then power the machine back up. There is no jam-reset button. If tickets run out, then an indicator L.E.D will light on the lower front entry door and `Please call the attendant’ is broadcast. Re-fill the ticket bin and feed tickets into the dispenser. If any ticket award is outstanding, this is completed automatically.

5. ACCESS

5.1 General. With the exception of re-loading tickets for the ticket machine, always isolate the machine from the mains supply.

5.2 Playfield. Release the lock at the top of the glass door and lift it up and out.

5.3 Coin entry. The coin entry housing cover is hinged at the bottom. Release the two locks to either side and pull the cover out towards you.

5.4 Lower Cabinet. Release the lock at the top of the lower cabinet door. Disconnect the wiring harness from the ticket machine, low LED and earth bond to remove the door completely.
A single back door is fitted which can be hinged open by releasing the two locks. This gives access to the logic board, motor and power supply.

5.5 Cash box. The cash box door is below the lower cabinet door. Release the lock at the top of the door to access the cash box.

5.6 Top sign. To access the topsign, unscrew the two screws on top and lift up. Remove the artwork. Inside is the light tray, tilt pendulum and alarm.

5.7 Hoppers. **ENSURE THE MACHINE IS SWITCHED OFF**
To access the hopper(s), first remove the front lower door.
The baseboard is held in place with two wing nut type screws. Release the wiring from the hopper and counters and slide the baseboard out.

6. ELECTRICAL SYSTEMS.

6.1 General Troubleshooting. In general disconnect the machine from the mains supply then check the physical condition and operation of the suspect device or unit. Remove from the machine if necessary and bench test if possible.
In general PCB's are not user serviceable. Should a problem develop indicating a board fault it is recommended that the board be returned for repair or replacement by your distributor, however, fault diagnosis and repair may be performed by skilled service personnel but this may invalidate the warranty. Many of the IC's are common components and are available from electronic component suppliers, or from Harry Levy Amusement Contractor Ltd.

6.2 Wiring check.
If faults occur with any electrical system: - SWITCH THE MACHINE OFF, then check that:
a) All fuses are intact (set).
b) All wires are properly secured to their connector terminals and pins.
c) All connector plugs and sockets are correctly mated.
d) No wires are trapped, damaged or broken.

A visual inspection will reveal the general condition of the wiring. A more thorough test using a continuity tester will be needed to check apparently intact wires, however once a machine has been playing successfully, wiring is very rarely a cause for concern.

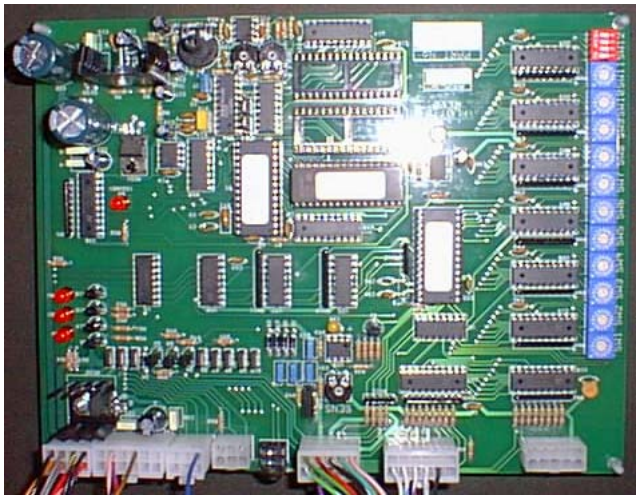
6.3 Power supply

The power supply is situated in the lower rear cabinet. If a fault occurs that affects the whole of the machine, the power supply should be checked first.

Check the reset fuses. These pop out if overloaded, push to reset.

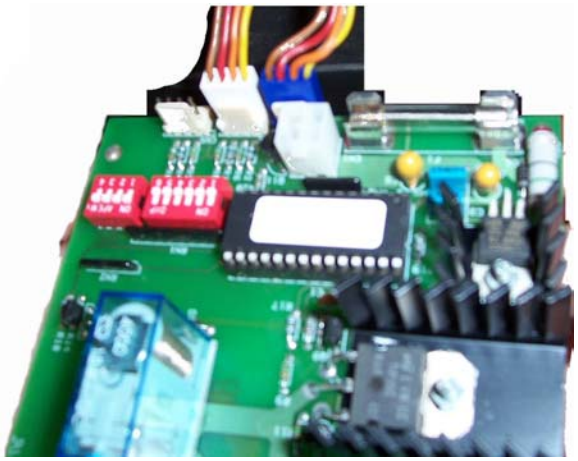
FUSES	Dichroic Lamps	2 @ 3 Amp
	12v Supply	5 Amp
	24v Supply	3 Amp
	30v Coin Eject	10 Amp (T) (fitted on ejector board – **see 6.5**).

6.4 Logic Board. This is clipped to the rear door. The user-adjustable items are:
Volume control.
Piezo microphone sensitivity.
Dipswitches. See section 7.6



A trimmer pot controls the microphone sensitivity. The sensitivity increases anti-clockwise. To adjust, turn anti-clockwise until the hopper runs (the hopper jingle sounds) then back it off about one eighth of a turn. Wait for the hopper to stop. Check operation by dropping coins all over the coin collector funnel.

6.5 Coin Ejector Board. The Coin ejector board is located inside the front door on the right hand wall. It controls the ejector motor start and stops times and coin in.



There is an opto sensor on the coin slide to detect the presence of a coin. The motor then ejects the coin after a preset time. A second opto sensor detects the motor arm and the motor is braked to the position set by dipswitches - see section 8.2.

6.6 Tilt. The tilt pendulum and alarm sounder are located in the topsign. Slam tilts are located on each cabinet wall and on the front door. Test for correct operation and adjust if necessary. When tilted the game will:

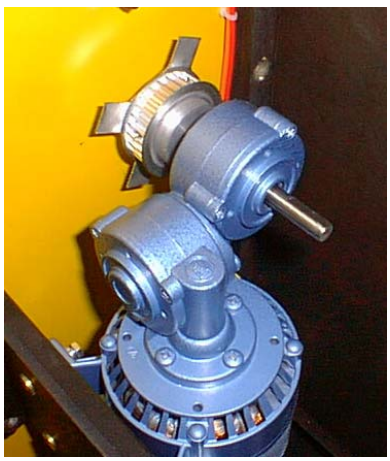
Turn off the topsign lights
Sound the alarm
Accept and eject coins but without the coin-in sound
Award compensation tickets only
Turn on the hopper to empty it. The alarm period will not end until the hopper is empty.
NOT award target bonus tickets
NOT award coins-over-edge tickets

6.7 Hopper microphone.
The microphone is attached to the coin collector funnel. When coins are detected the hopper runs until empty.

6.8 Speaker. The speaker is fitted to the front left wall below the collector funnel. It is rated at 8-Ohm 20Watts.

6.9 Lighting. The top sign has a 13-Watt fluorescent tube with its attendant gear tray. The playfield has a pair of dichroic lamps rated 12Volts 35 Watts.

6.10 Paddle drive motor and cut-out switch. The paddle motor is located inside the lower cabinet under the playfield.



A cutout switch in the form of an opto sensor and a revolving cross control the motor operation. If the paddle jams, the motor is switched off. Switch the machine off and investigate the cause. Switch on.

6.1 Coin and ticket counters. Coins and tickets are counted. A third counter is fitted if the game is intended to be fitted with a swipe card changer system. Counters are located inside the lower cabinet.

7. Mechanical Systems

7.1 Paddle motor drive. The paddle motor is connected by belt to the paddle shaft assembly. The bearings are sealed for life and the belts do not stretch.

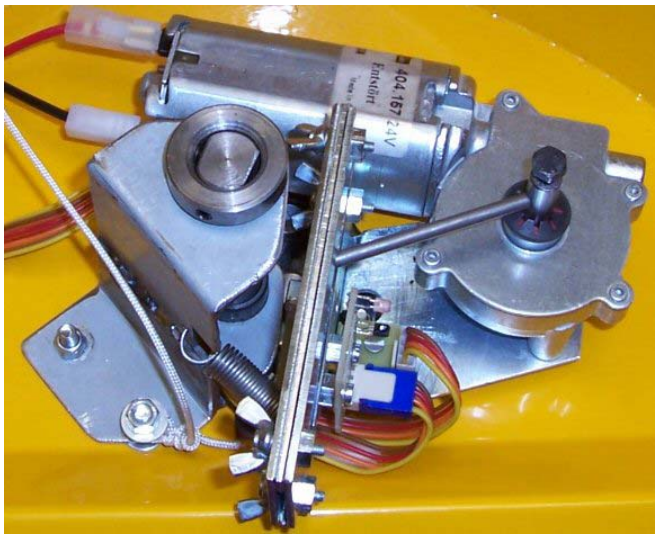
If the belt should become damaged: remove the metal (or plastic) cover by removing the 3 off cross-headed screws, then loosen the 4 off M5 bolts with an 8mm spanner. Lift up the motor until it hits the end stops and remove the belt.

7.2 Paddle assembly. The paddles are held in place with 2off 2BA grub screws.

7.3 Coin entry chutes. The coin entries are tailored to suit a certain size coin, and to change the coinage would require a new chute.

7.5 Diverter. (U.K. only). The diverter is attached to the front door. If a problem arises, first check that the solenoid works, and that it operates the diverter flap smoothly. Remove any obstruction. If the solenoid does not function then replace it.

7.6 Coin ejector assembly. The system incorporates a 24v motor pulsed with 30Volts! Start & stop times can be set by dipswitches. See section 8.2



delay should be set so that the targets are easily hit and coins do not rebound to the front of the playfield.

If coins are fed rapidly, the motor and driver board heat sink get hot and subsequently the performance is degraded.

8.0 Switch settings.

Programs:	Logic	SURF02 V1.4
	Sound	QSOUND45 V1.1
	Sound Eprom	SURF_C V1.0

8.1 Dipswitch settings - Main Logic PCB.

SW1 Target 1 award - lamps NOT lit.
SW2 Target 2 award - lamps NOT lit.
SW3 Target 3 award - lamps NOT lit.
SW4 Target 4 award - lamps NOT lit.

Switch position	Qty
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

SW5 Targets 1 & 4 award - lamps LIT.
SW6 Targets 2 & 3 award - lamps LIT.

Switch position	Qty
0	1
1	2
2	3
3	4
4	5
5	8
6	10
7	15
8	20
9	25
A	40
B	50
C	60
D	75
E	100
F	150

SW7 Ratio – coins over edge: payout

Switch position	Qty
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

SW8 Tickets on coin in

Switch position	Qty
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

SW9 Ratio – Swipe card input: change coin

Switch position	Qty
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

SW10 Attract sound time interval

Switch position	Qty
0	No attract sound
1	30 sec
2	60 sec
3	90 sec
4	120 sec
5	150 sec
6	180 sec
7	210 sec
8	240 sec
9	270 sec
A	300 sec
B	330 sec
C	360 sec
D	390 sec
E	420 sec
F	450 sec

SW11 Spare – not used

SW12	Pole	1	Payout device
		off	coin
		on	ticket

SW12 Target Lamp Speed

	Pole	2	3	4	Speed
		off	off	off	1 - fastest
		on	off	off	2
		off	on	off	3
		on	on	off	4
		off	off	on	5
		on	off	on	6
		off	on	on	7
		on	on	on	8 – slowest

8.2 Dipswitch settings – coin ejector board. Program CFIRE10 V1.0

SW1 6-way

	Pole	1	2	3	4	5	6	coin eject speed
		Off	off	off	off	off	off	Fastest
		Off	off	off	on	off	off	Factory setting
		On	on	on	on	on	on	Slowest

Note: there are a total of 64 binary codes, too confusing for most people.
For general guidelines, pole 1 changes by the least amount, pole 6 by the greatest, the rest in ascending order.

SW2 4-Way Start delay All poles on.

9. Trouble shooting

The following is a guide to some faults and remedies. Always replace faulty items with units of the same specification. Determine the cause of the fault and rectify to avoid recurrence of a problem. Test a coin mech. or ticket dispenser by fitting a known good unit from another machine in place of the suspect unit. The ticket machines are quite easy to fault find and repair on site.
Electronic Coin Mechs are not intended to be site serviceable, and will need to be replaced.

Symptom	Possible Fault	Remedy
No Sound	Volume / Speaker	Adjust volume / Check speaker
Lights out	Tube, starter, choke	Check each item. Replace if faulty
Ticket machine not working	Ticket motor / PCB	Bench test. Check transistor 2N2222, IC40106 Opto sensor. Refer to Deltronic manual.
Paddle not moving	Jammed Opto sensor Driver PCB	Investigate & restart Replace Change driver PCB (inside PSU)
Machine not paying out	Counter hopper Payout hopper	Change hopper. Change hopper opto Re-fill hopper / Change hopper
Coin counter not working Ticket counter not working	Counter / opto sensor Check counter Check ticket opto	Test / change for new one. Change for new one. change ticket machine.
Coins not ejecting	Optos wrongly wired Coins too small Driver fuse blown	Reverse opto wires Use correct coins Check. Replace.
Coin not ejecting right	Fire control OPTO Not working	Replace OPTO

10.0 Parts List

Here are listed some of the parts more prone to need replacement. For parts not listed here please ask your agent or contact Harry Levy Amusements Ltd.

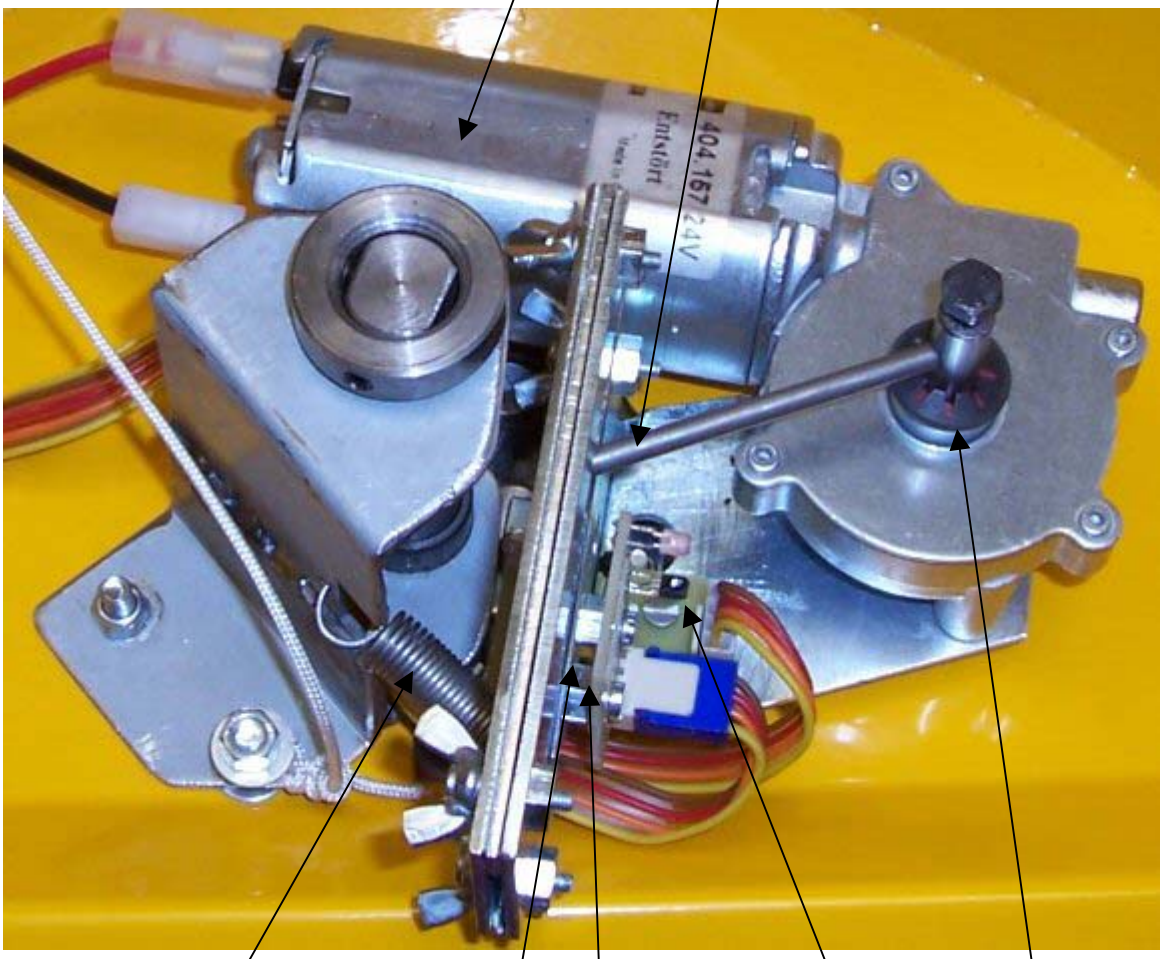
6029	Counter
6082	Bulb
6144	Hopper
6243	Light Tube
6355	Playfield Motor
6381	Ticket Dispenser
6488	Dichroic Lamp
6594	Microphone
6610	Keyswitch
6704	Choke
9492	Coin Eject Motor
8636	Circuit Breaker 3 Amp Mains
8859	12V PSU
8860	24V PSU
8879	Circuit Breaker 3 Amp Low Voltage
8881	Circuit Breaker 5 Amp Low Voltage
22004	Light Starter
14333	TURN Sticker
SF2507	Gorilla Target
SF2508	Mouse Target
SF2509	Lion Target
SF2510	Bear Target
22261	Logic PCB
7819	Tilt Sounder PCB
8353	Mains Relay PCB
8617	Opto PCB
8641	Swipe Relay PCB
8688	Coin Eject PCB
16745	Striker arm
15150	Striker shaft

See the following photographs for part identification of firing mechanism parts.

MANUSA02.WPS

9492 Coin Eject Motor

16745 Hitter Arm

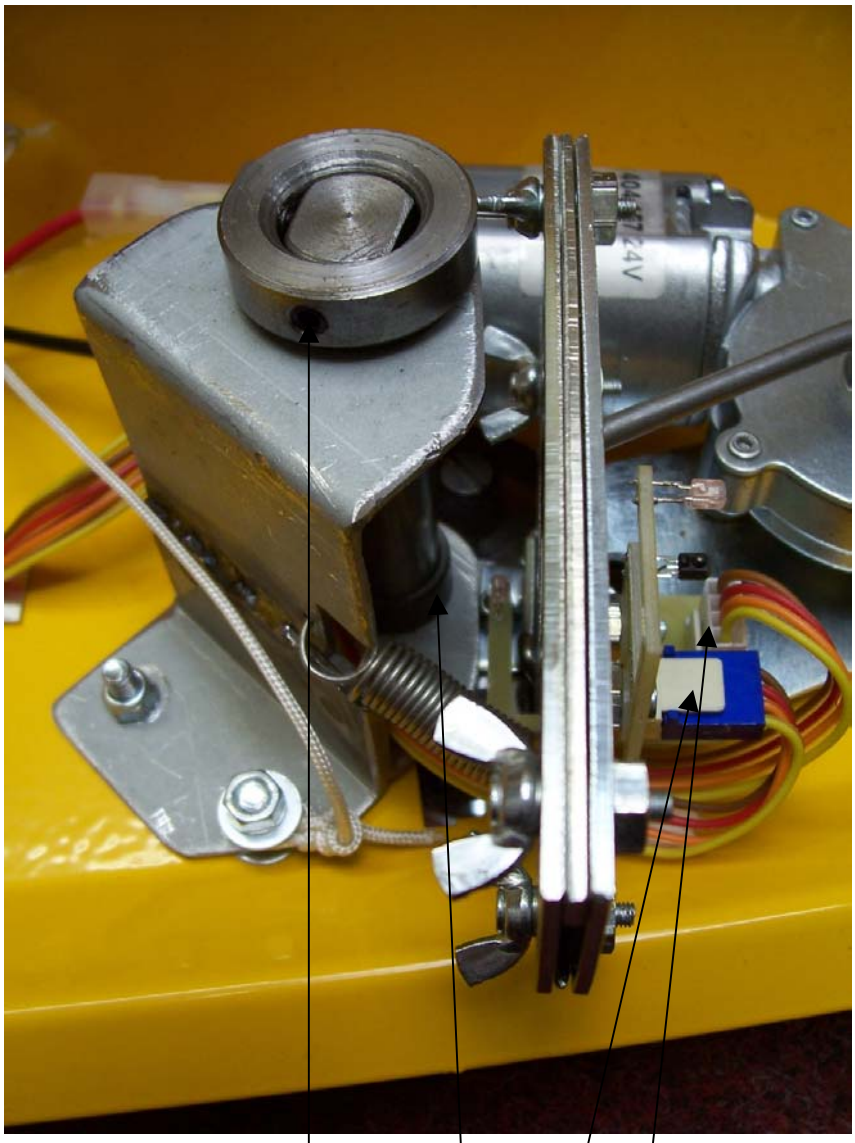


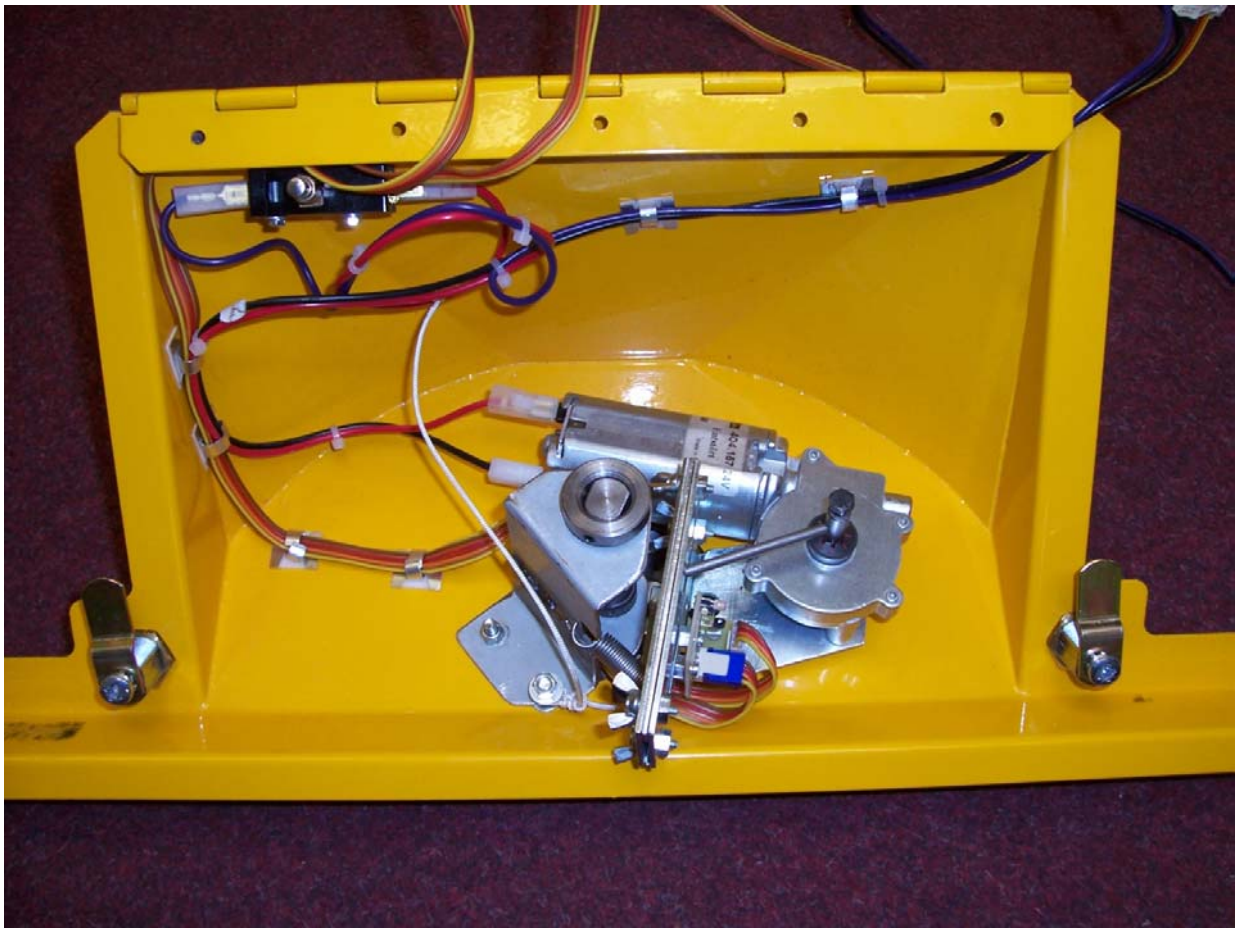
7054
SPRING

8617 OPTO PCB

Nylon Washers between
metal and OPTO PCB

6684 8mm Push on fastener


14988 Bush Collar
8581 Bearing
14370 OPTO Loom
15141 OPTO Loom

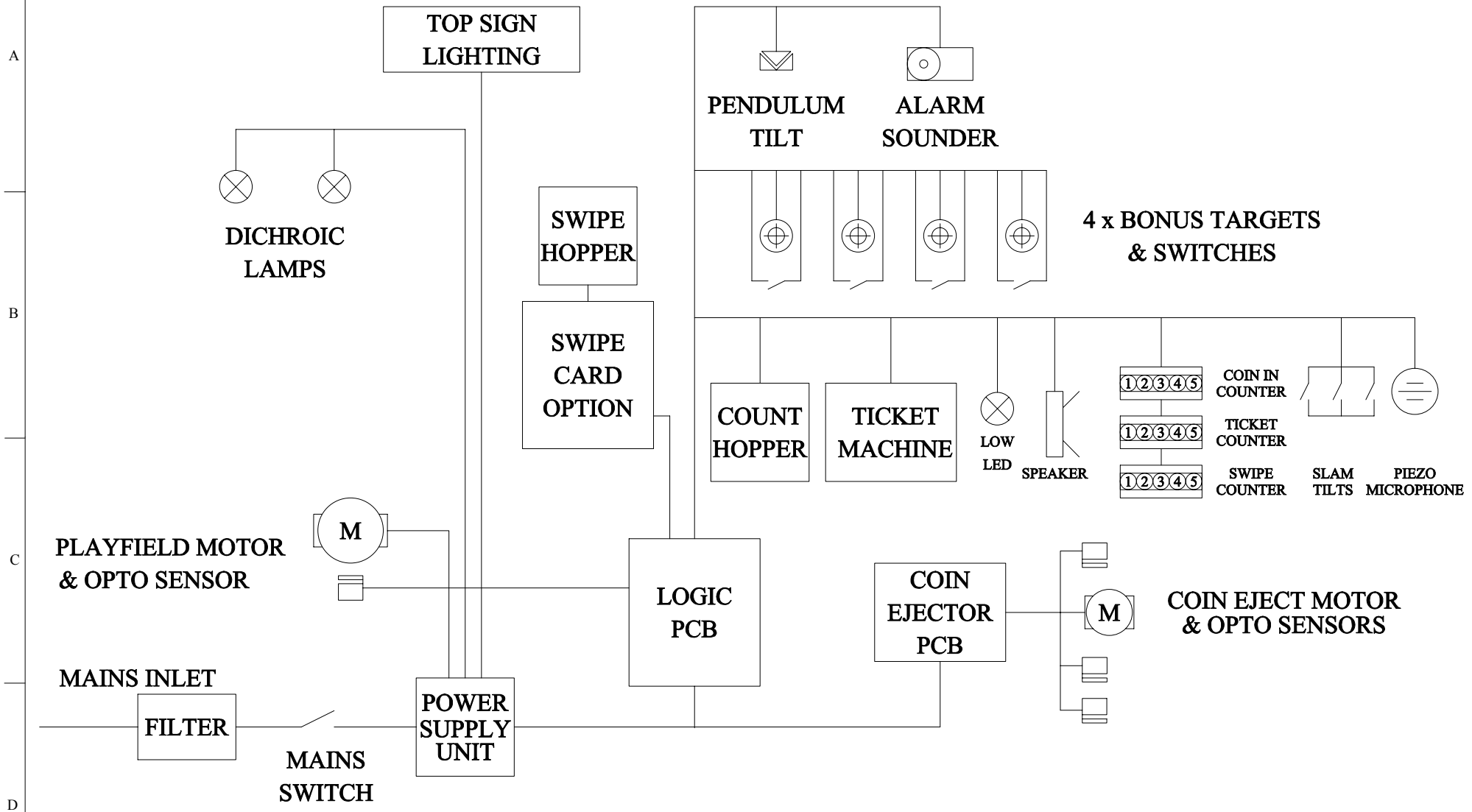


Section 11 – Schematic Diagrams

The following drawings follow:

DRAWINGS HL SF 14508
HL SF 14509
HL SF 14510
HL SF 14511
HL SF 14512

HL SF 14508-D



Issue	Description	Date	App'd
2	EXTRA COIN EJECT SENSOR ADDED	13 06 02	NGI

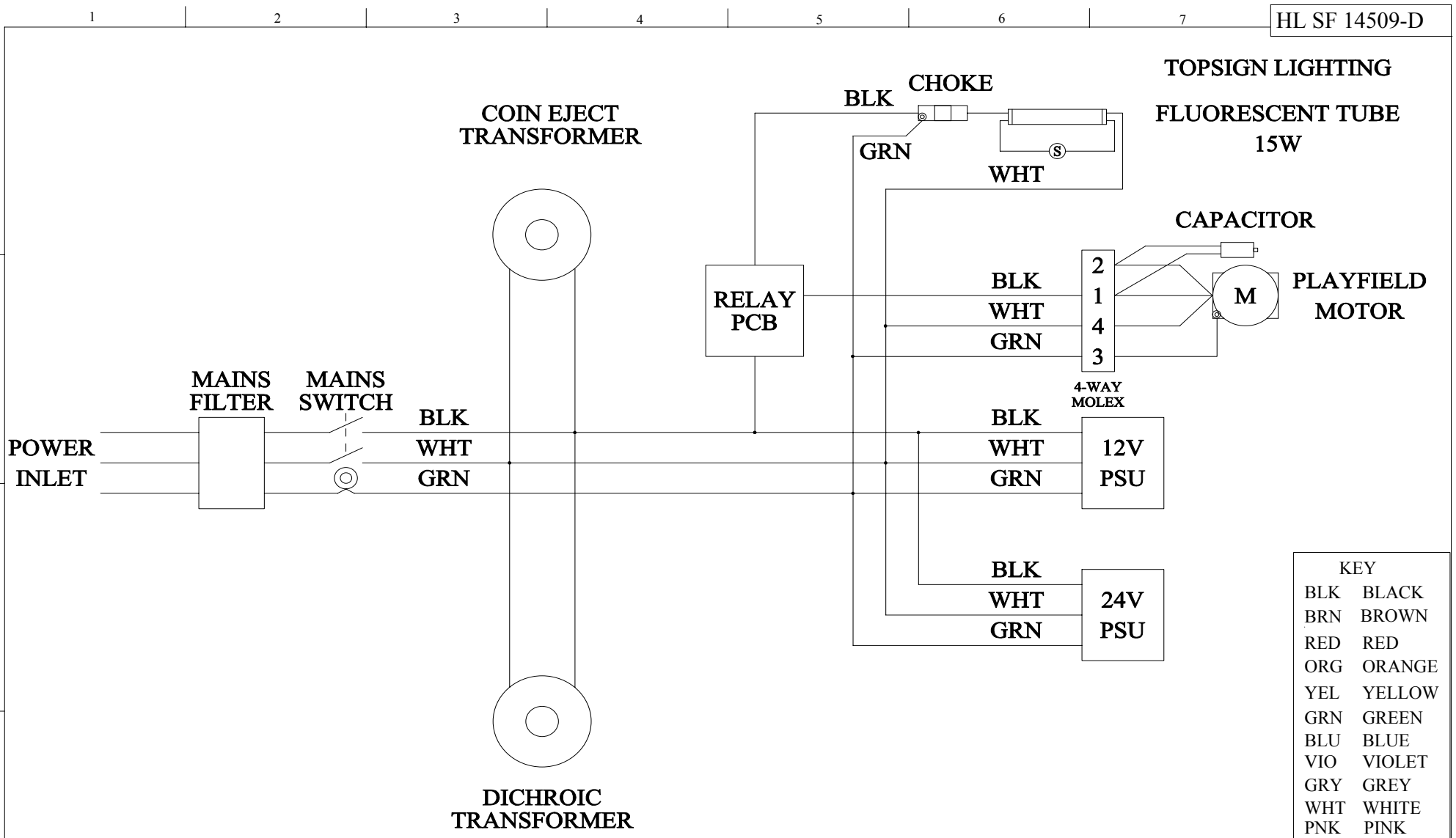
To; 1501
1502
2209

Title: Electrical System Overview USA

Drawn: NGI | Checked: | Date: 01 11 01 | Do NOT Scale

HARRY LEVY AMUSEMENT CONTRACTOR Ltd Broadstairs Kent.
Dimensions in MM. General Tol. +/-1, metalwork & hole positions +/-0.5 turned parts +/-0.1, bending +/-1 (Plastic +/-2.5 degrees)

Drawing No. HL SF 14508 - D



Issue	Description	Date	App'd

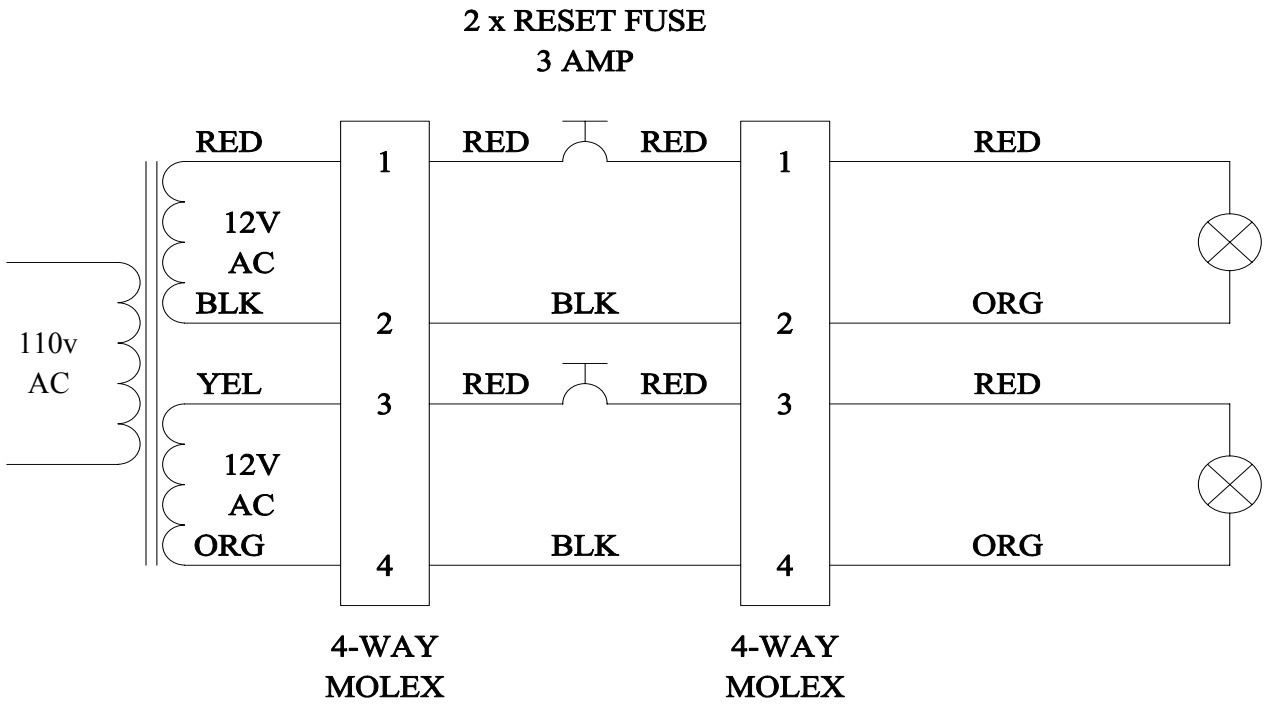
To; 1501
1502
2209

Title: Mains Wiring UL

Drawn: NGI | Checked: | Date: 02 11 01 | Do NOT Scale

HARRY LEVY AMUSEMENT CONTRACTOR Ltd Broadstairs Kent.
Dimensions in MM. General Tol. +/-1, metalwork & hole positions +/-0.5 turned parts +/-0.1, bending +/-1 (Plastic +/-2.5 degrees)

Drawing No. HL SF 14509 - D



KEY

BLK	BLACK
BRN	BROWN
RED	RED
ORG	ORANGE
YEL	YELLOW
GRN	GREEN
BLU	BLUE
VIO	VIOLET
GRY	GREY
WHT	WHITE
PNK	PINK

Issue	Description	Date	App'd

To; 1501
1502
2209

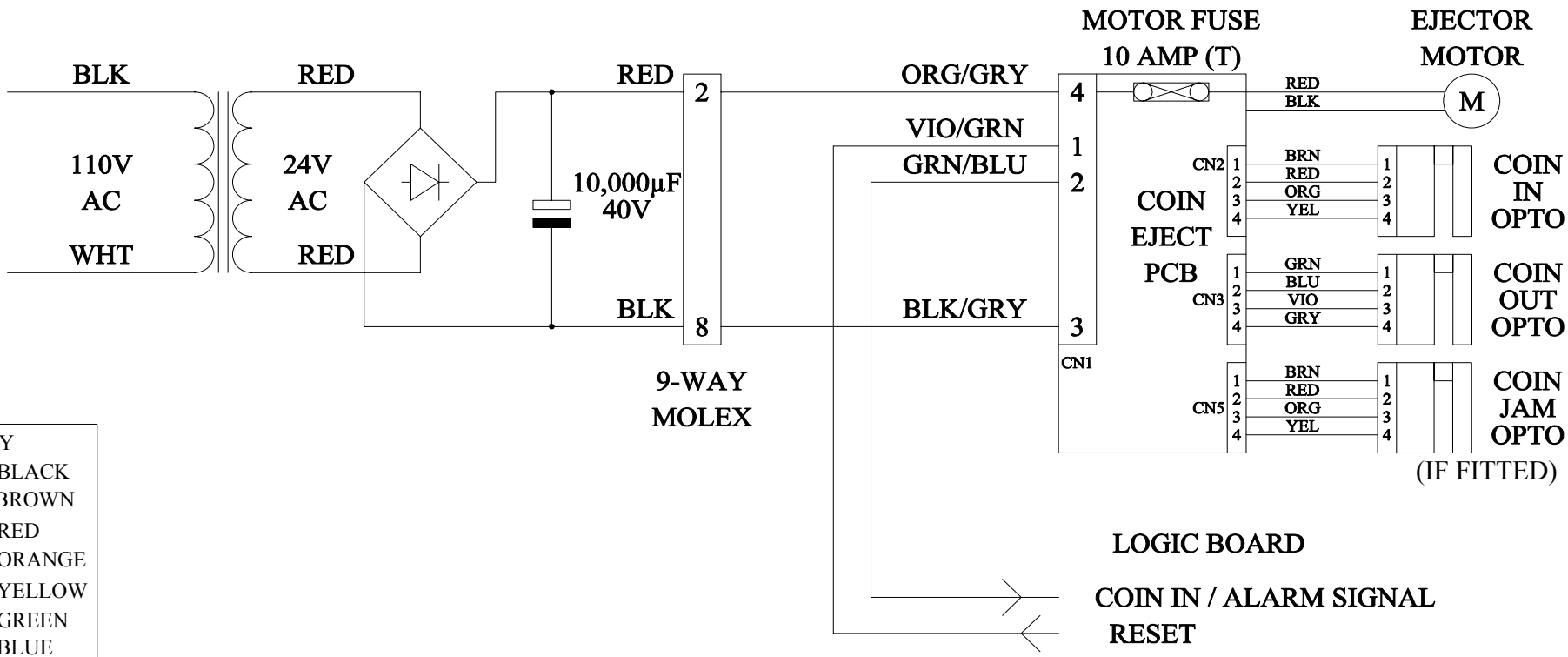
Title: Dichroic Lamp Wiring

Drawn: NGI | Checked: | Date: 02 11 01 | Do NOT Scale

HARRY LEVY AMUSEMENT CONTRACTOR Ltd Broadstairs Kent.

Dimensions in MM. General Tol. +/-1, metalwork & hole positions +/-0.5 turned parts +/-0.1, bending +/-1 (Plastic +/-2.5 degrees)

Drawing No. HL SF 14510 - D



KEY	
BLK	BLACK
BRN	BROWN
RED	RED
ORG	ORANGE
YEL	YELLOW
GRN	GREEN
BLU	BLUE
VIO	VIOLET
GRY	GREY
WHT	WHITE
PNK	PINK

Issue	Description	Date	App'd
2	COIN JAM OPTO ADDED	13 06 02	NGI

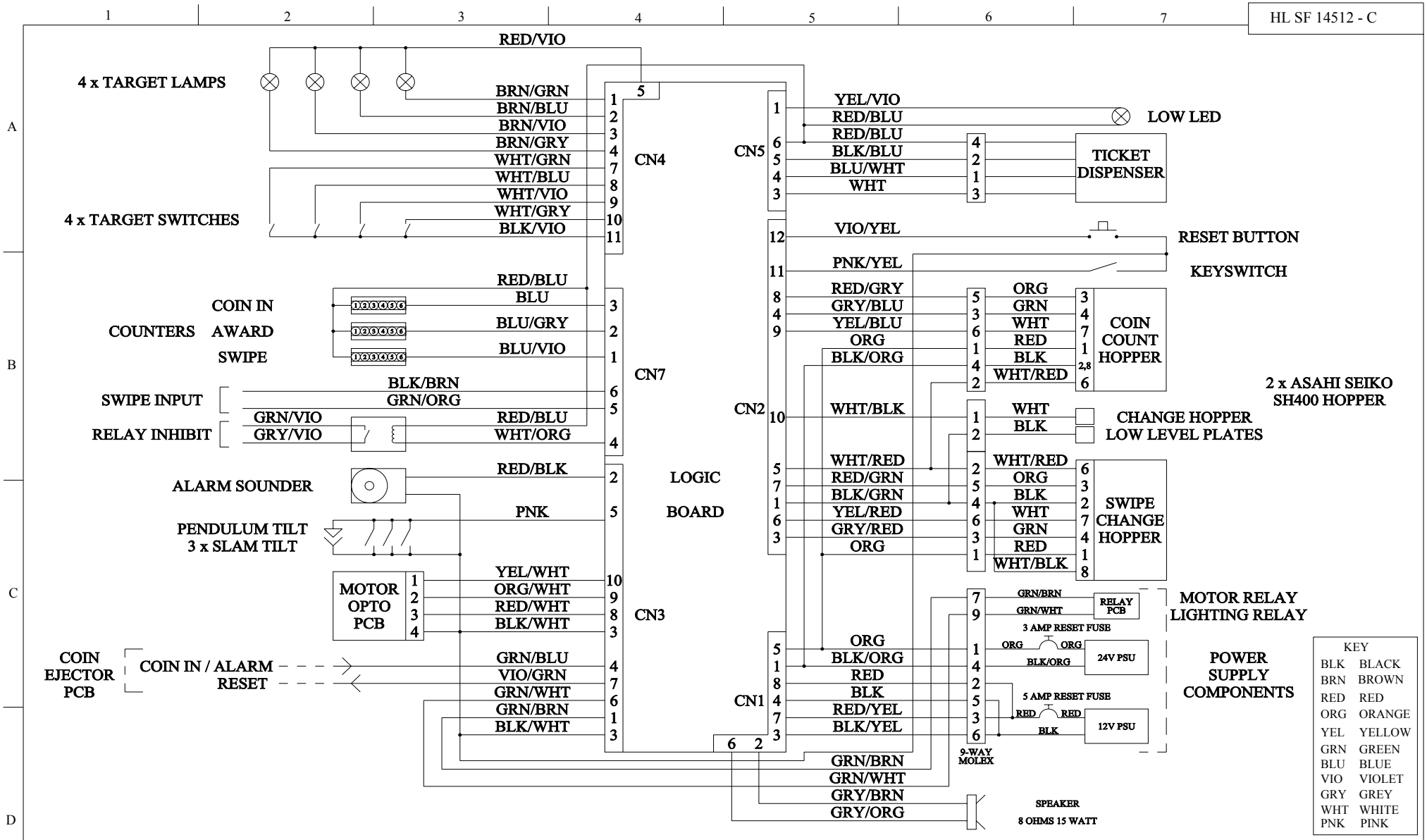
To; 1501

Title: Coin Ejector Wiring

Drawn: NGI | Checked: | Date: 02 11 01 | Do NOT Scale

HARRY LEVY AMUSEMENT CONTRACTOR Ltd Broadstairs Kent.
Dimensions in MM. General Tol. +/-1, metalwork & hole positions +/-0.5 turned parts +/-0.1, bending +/-1 (Plastic +/-2.5 degrees)

Drawing No. HL SF 14511 - D


HL SF 14512 - C
4 x TARGET LAMPS
4 x TARGET SWITCHES
RED/VIO
BRN/GRN
BRN/BLU
BRN/VIO
BRN/GRY
WHT/GRN
WHT/BLU
WHT/VIO
WHT/GRY
BLK/VIO
CN4
COIN IN
COUNTERS AWARD
SWIPE
RED/BLU
BLU
BLU/GRY
BLU/VIO
CN7
SWIPE INPUT
BLK/BRN
GRN/ORG
RELAY INHIBIT
GRN/VIO
GRY/VIO
RED/BLU
WHT/ORG
ALARM SOUNDER
RED/BLK
PENDULUM TILT
3 x SLAM TILT
PNK
LOGIC
BOARD
MOTOR
OPTO
PCB
YEL/WHT
ORG/WHT
RED/WHT
BLK/WHT
CN3
COIN
EJECTOR
PCB
COIN IN / ALARM
RESET
GRN/BLU
VIO/GRN
GRN/WHT
GRN/BRN
BLK/WHT
CN5
YEL/VIO
RED/BLU
RED/BLU
BLK/BLU
BLU/WHT
WHT
LOW LED
TICKET
DISPENSER
VIO/YEL
RESET BUTTON
PNK/YEL
KEYSWITCH
CN2
RED/GRY
GRY/BLU
YEL/BLU
ORG
BLK/ORG
WHT/BLK
WHT/RED
RED/GRN
BLK/GRN
YEL/RED
GRY/RED
ORG
ORG
GRN
WHT
RED
BLK
WHT/RED
COIN
COUNT
HOPPER
2 x ASAHI SEIKO
SH400 HOPPER
WHT
BLK
CHANGE HOPPER
LOW LEVEL PLATES
WHT/RED
ORG
BLK
WHT
GRN
RED
WHT/BLK
SWIPE
CHANGE
HOPPER
CN1
ORG
BLK/ORG
RED
BLK
RED/YEL
BLK/YEL
9-WAY
MOLEX
GRN/BRN
GRN/WHT
GRY/BRN
GRY/ORG
SPEAKER
8 OHMS 15 WATT
GRN/BRN
GRN/WHT
RELAY
PCB
MOTOR RELAY
LIGHTING RELAY
3 AMP RESET FUSE
ORG
ORG
BLK/ORG
24V PSU
5 AMP RESET FUSE
RED
RED
BLK
12V PSU
POWER
SUPPLY
COMPONENTS
KEY
BLK BLACK
BRN BROWN
RED RED
ORG ORANGE
YEL YELLOW
GRN GREEN
BLU BLUE
VIO VIOLET
GRY GREY
WHT WHITE
PNK PINK
Issue
Description
Date
App'd
To; 1501
Title
Logic Wiring
Drawn
NGI
Checked
Date
02 11 01
Do NOT
Scale
HARRY LEVY AMUSEMENT CONTRACTOR Ltd Broadstairs Kent.
Dimensions in MM. General Tol. +/-1, metalwork & hole positions +/-0.5
turned parts +/-0.1, bending +/-1 (Plastic +/-2.5 degrees)
Drawing No.
HL SF 14512 - C